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BANQUET

JANUARY 31, 1925

At AMERICAN ANNEX HALL

An educational session in the afternoon, under direction of G. S. Robins. Dr. H. C. Ward will have prominent part on the program.

Special party for the ladies during afternoon.

Banquet in the evening, at which Supreme President F. J. Hanlon and Supreme Secretary E. J. Musick will be the principal speakers.

You are invited to meet with the St. Louis Branch.

MONTHLY REVIEW

Published by the

American Electroplaters' Society

ONEIDA, NEW YORK

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ARE YOU BEHIND OR IN FRONT

We are again almost at the close of another year and within our Society it has made history and progress, I fully believe at least in proportion to what we have put into it, and as to the measure of our accomplishment along that line, it will, perhaps, be just as well at this time if I leave the rank and file of our membership reflect individually upon the scope their own efforts to help push our good work along.

What a wonderful opportunity we have had, and have we made the most of it during the year closing, for afterall the measure and extent in which members in our Society can enjoy the fruits of their field depends entirely upon the fullness of his co-operation with, and contribution to others, and remember too while we ponder upon the subject that we have at our disposal the ability and knowledge of a thousand fellow workers.

If our success has not been all we might expect very likely the fault is not of the Society, but might be traced to our own reluctance in accepting revealed processes because they may have differed somewhat from our accustomed practice, particularly when these new and revealed processes are based upon definite scientific facts, we are then in the position of those people in (1564-1642) who scorned Galilee, and again in (1511-1553) Servetus was held up to ridicule and scorn for his advanced thought and revealed the mehods of prescribing drugs for patients which afterward became general, I might cite other intsances in the progress of Science in nearly all lines where all advancement at first was held as ridiculous but are accepted truths today, therefore it is largely a question of where do we

stand, have we allowed the curtain of knowledge to raise or drop all the way, and are we really all the way out of our shell.

A complete and full analysis of ourselves on the eve of a New Year will show where we have been remis and open the way for better accomplishments, hence the intent of the captain in the title of my Message this Month, are you behind or in front, just contemplate seriously and make appropriate resolutions for the New Year.

For life talents and Fame
Are given to us in trust
And each must work with the gifts he has
Until returns are achieved thus
And this is the spirit that governs all
Since this is the common test
That he who would covet the best the Society has
Must give the Society his best.

With this message I wish you one and all a Very Merry Christmas and a Happy and properous New Year.

F. J. HANLON,
Supreme Pres.

METAL CLEANING WITH ALKALINE CLEANING SOLUTIONS

Summary of a paper published by E. M. Baker and Richard Schneidewind.

The original paper was published in the Transactions of the American Electrochemical Society, 45, 327 (1924).

In cleaning metals, e. g. prior to electroplating, it may be necessary to remove (1) oxides, such as iron rust, (2) grit or similar foreign particles, and (3) oil and grease. The oxides are usually removed by pickling. Grit is held principally by the grease and is therefore detached when the latter is removed.

Grease may be removed by organic solvents such as gasoline and benzol, but these are usually expensive and inflammable and the fumes may be objectionable. In most cases therefore, alkaline solutions are employed. The principal compounds used in commercial cleaners are sodium hydroxide (caustic soda, NaOH), sodium carbonate (soda ash, Na_2SiO_3), rosin and soap.

It has been hard to estimate the relative efficiency of various cleaning solutions, owing to the difficulty of controlling the conditions and of determining just when the surface is clean. If however, some property of the solution could be measured which largely determines its value in cleaning, the effectiveness of various solutions could be readily compared.

It is now generally recognized that the principal process involved in the removal of grease by alkaline solutions, is "emulsification." (An emulsion is an intimate mixture of two liquids, in which the one liquid is suspended in the other in the form of very small drops. Thus, e. g. milk is an emulsion in which the minute drops of butter fat are in suspension. That the fat is not in true solution is shown by the fact that it rises to the surface as cream on standing.)

The tendency of any two liquids to form emulsions with each other, depends upon the "surface tension" existing at their point of contact. If this surface tension is high, as e. g. between water and oil, there will be very little tendency to form an emulsion, i. e. "water and oil will not mix." (The condition is illustrated by the "water-break" on greasy metal surfaces.) If however the surface tension is decreased, e. g. by adding alkali or soap to the water, there will be a greater tendency to form emulsions. Finally, if the surface tension between the two liquids disappears entirely, e. g. between oil and gasoline, the one is soluble in the other and we obtain a "true solution," and not an emulsion.

In this paper a simple apparatus is described, by which the relative surface tensions between oil and certain solutions may be measured, and the relative cleaning efficiency of these solutions maythus be predicted. The operation consists simply in measuring the relative sizes of the drops formed when the solution flows from a small tube into oil under specified conditions.

Suppose that into each of three separate test tubes containing lubricating oil a small fine-bore or "capillary" tube is inserted, and that water is run into the oil in the first tube; into the second an alkaline solution (e. g. of sodium carbonate) and into the third an organic solvent such as

gasoline. It will then be observed that the water as it issues from the capillary forms large drops, the alkaline solution smaller drops, and the gasoline will run in without forming separate drops. The decrease in the size of the drops therefore corresponds to the decrease in surface tension.

To measure the relative surface tensions, all that is necessary is to determine the relative size of the drops under uniform conditions. This was done in an apparatus similar to that just described, and the results are expressed in comparison with the size of the drops of distilled water under specified conditions. A commercial lubricating oil was used as typical of the usual oil to be removed.

The results obtained with solutions of various substances likely to be present in alkaline cleaners, showed that for chemically equivalent concentrations, the surface tension was reduced to the greatest extent by sodium hydroxide, tri-sodium phosphate, sodium carbonate, sodium silicate and soap, all of which are known to be valuable constituents of cleaning solutions. In most cases the results with solutions containing two compounds, e. g. sodium hydroxide and sodium phosphate, were about the average of the results with the separate solutions. However, a small addition of borax to trisodium phosphate decreased the effectiveness of the latter more than in proportion to the lower cleansing power of the borax.

It was found that the emulsification is greater in hot soltuions such as are usually employed in cleaning. It was shown that this effect is due principally to the reduction in the "viscosity" of the oil at the higher temperature. Such an effect is illustrated by the fact that upon heating, any solid greases are converted into liquids, which can readily form emulsions.

Soap was found to have the greatest emulsifying action of any of the substances tested. One objection to the use of soap in cleaners, is that it produces too permanent an emulsion, and hence the solution must often be replaced or replenished. Trisodium phosphate, on the other hand, forms an emulsion which is less stable so that on standing quietly for a few hours, the oil rises to the surface, from which it can be skimmed off, without appreciable loss of the phosphate.

The investigation led to the following recommendations for the preparation and use of cleaners:

1.—Sodium hydroxide and trisodium phosphate are the most effective constituents of cleaners. The latter is less likely to stain the metal and is more easily rinsed from the work than is sodium hydroxide.

2.—A mixture of sodium hydroxide and disodium phosphate (Na_2HPO_4) in molecular proportions produces trisodium phosphate and is equally effective. If not uniformly mixed, some portions may contain free caustic, which may attack the hands.

3.—Soaps are especialy useful for removing grit, but are hard to rinse, and are relatively expensive. Very soluble soaps, e. g. linseed oil soaps, are better than the harder stearic acid soaps.

4.—Glycerine is objectionable in cleaners, as it causes peeling. If fat is added to a strongly alkaline solution, "saponification" occurs, i. e. soap and glycerine are formed. This method should not however be used to produce the soap in cleaning solutions.

5.—Sodium silicate (water glass) is an effetcive substitute for soap.

6.—The cleaner should be kept at as high a temperature as possible.

7.—Agitation aid cleansing. Air agitation however cools the solution.

8.—Electrolytic cleaning is effective only if the current density it at least equal to 10 amp./sq. ft., and preferably higher. Cathode cleaning is desirable except when cleaning a nickel surface to be re-nickled, when anode cleaning is suggested.

9.—The life of a cleaner may be increased by skimming the oil from the surface each morning, and allowing the heavy dirt to settle below a false bottom.

Abstracted by W. BLUM

A COURSE OF INSTRUCTIONS

Given by the Philadelphia Branch by Willard M. Scott, Librarian

The remarkable progress this branch has made in the chemical class is indeed an incentive for the other branches, and a step forward in the direction of scientific electroplating.

The large attendance throughout the elementary chemistry course, which is dry and hard to comprehend, is indicative of the fact that this attendance will continue in the future. The enthusiasm of the twenty-five students, who for the first time made an analysis of a solution, was evidence of their desire to make themselves more efficient in their science.

The instructor, Mr. Graham, who is affiliated with the University of Pennsylvania faculty, has shown the necessity of each subject and what it leads to avoiding unnecessary topics, and including volumetric analyses pertaining only to our plating solutions. I know it would be impossible to obtain at any institution such an abbreviated course in chemistry.

In our past studies we have talked about normal solutions, we defined the normality of an acid by the hydrogen fatcor of the solution, and you will recall that we took the molecular weight of hydrochloric acid 35.5 for chlorine 1 for hydrogen equals 36.5 and divided by the number of atoms in the hydrogen. This holds good in nearly all cases; this particular one being 36.5 grams of acid to a liter to make a normal solution, and this solution will be used in our first analyses.

Now we do know the definite strength of this standard solution, and we know that a normal solution of any acid contains 1.008 grams of ionizable hydrogeen per liter, and that a normal solution of any base contains 17.008 grams of ionizable hydroxyl per liter. It is evident that a liter of one exactly neutralizes a liter of the other, or equal volumes are equivalent, so to determine the strength of an unknown sodium hydroxide solution we use the above normal acid, and we do this by titrating one against the other.

We measure out a definite volume of Na OH, say 16 cc in a beaker, and a few drops of phenolphtalein solution are added to this which of course turns blue.

We then carefully run in drop by drop of the normal acid solution until one extra drop turned the blue to red. This showing just enough acid to react with the base, and in reading the burette we found it took 20 cc of acid to neutralize 16 cc of the unknown Na OH.

This may be expressed as follows:

Volume of acid equals Normality of base
——————————————— Equals Normality
Volume of base equals Normality of acid

5
20 cc
V-a equals N-b
equals 5
———————— —
4 equals 1.25
V-b equals N-a
16 cc 1.
4

.40 grams of Na OH equals I. Normal.

.04 grams of Na OH in I cc of I. Normal.

.04x1.25—.05 grams of Na OH in I cc of 1.25 solution.

1000 cc X .05—equals 50. grams of Na OH in I Liter.

50. divided by 7.5 equals 6.7 ounces per gallon of Na OH in unknown strength solution.

We have for the first time made an analyses of a solution, finding the contents in ounces per gallon, and the above method wil ble applied to nearly all titrated analyses.

DO PURE ZINC ANODES PAY?

By Oliver W. Storey, Chemical Engineer,
C. F. Burgess Laboratories, Madison, Wis.

The answer to the question, "Do Pure Zinc Anodes Pay?" is an emphatic, "Yes!" This answer is based on carefully-kept cost data and confirms conclusions based on theory alone. One large manufacturing company of Milwaukee has found that by using zinc anodes of an exceptionally high degree of purity it has been able to effect a saving in zinc cost of 33 per cent. over the zinc cost when anodes of ordinary purity were used. The following statement by the manager of the plating department relative to

lower metal cost due to the use of zinc anodes of exceptionally high purity is self-explanatory:

"We use two methods in our plating department, namely, still tank plating and mechanical plating. The work ranges from small parts made of band iron to burner bowls made of drawn steel. Besides this general run of work we plate the supply pipes used on the stove and the cast iron grates. Our still tank equipment is so arranged that each part of each type of part has its individual set of tanks and one operator does the entire set of operations from pickling to plating.

"We arrived at our plating cost per one hundred pieces as follows: The tanks were cleaned thoroughly, as were the anodes. As we were only interested in the weight of the zinc deposited, all of our attention was directed to the anodes. These were very carefully weighed and replaced in the tanks. Then over a period of two months an accurat count of the number of pieces plated was kept. At the end of the two months the anodes were again taken from the tank and carefully cleaned and weighed. The difference in weight represented the amount of metal placed on the parts and with this information it was relatively an easy matter to apportion the amount of metal on each kind of part. This was done by calculating the area of each part and assuming that the deposit of metal was equal in every case and that the amount of metal was proportional to the area. The metal used was then apportioned to each part according to the total amount of area and from these figures the amount of metal per 100 pieces was calculated.

"A schedule of metal weights was then made and was used in figuring the itemized cost of each particular item. The amount of metal used on each lot was then charged against the inventory of zinc anodes. Every two months an accurate inventory of the anodes was taken and adjustments made until the amount of metal used, according to schedule, equalled the amount of metal reported used. This method of calculating, of course, takes into account all losses incidental to the

operation of the plant, losses due to impurities in the anodes, replating losses, etc. It is obvious that the amount of metal actually used on the parts is less than the figure used in the costs, but it is obvious that each part should bear its share of the losses and, therefore, the method used is legitimate and will give a true cost.

"Shortly after beginning the use . . . anodes, we noticed that the return of metal was becoming greater or that the schedule was higher than the amount of metal reported used. In one case the schedule figured approrimately 300 pounds and the metal used 200 pounds, or a saving of 100 pounds—33 per cent. This difference was noted at several successive inventories and we then reduced our schedule weights about 20 per cent. and used the balance to build a surplus inventory.

"We attribute these results to a number of factors —purity of the zinc anodes, less loss due to the absence of pitting, particularly when the anode has been reduced in size, a firmer, denser coating enabling the work to be passed with less actual metal on the surface and less rejected work to be replated."

It is unfortunate that an exact analysis of the anodes previously used is not known, but analyses of anodes from the same dealer show about 0.65 per cent. of impurities, whereas, the high grade anode which resulted in a 33 per cent. lower metal cost shows about 0.14 per cent. impurities.

The results on a commercial scale serve to emphasize the conclusions based on theory. These results also are somewhat analogous to those obtained in the electrolytic refining of zinc where it has been found that the electrolytic refining is only possible if the zinc solutions are of the highest purity. Data given later in the report will show that impurities in the anode can directly affect the quality of zinc deposited.

There have been several papers within the last few years which deal with the electro-deposition of zinc and which have a direct bearing on the purity of zinc anodes. Papers by U. C. Tainton (Transaction of the American Electrochemical Society, Vol. 41, 1922) and by John T. Ellsworth (Trans. Amer. Electrochemical Soc., Vol. 42,

1922) bear directly on this subject and should be of interest to all users of zinc anodes. The effect of even minute quantities of some impurities on the corrosion of zinc is shown in these papers. Tainton describes a zinc so pure that it is virtually a new metal in its properties when its resistance to corrosion is considered. This work would indicate that the zinc which is plated on steel or iron should be of the highest purity to secure the greatest resistance to corrosion. These papers show that slight impurities have a tendency to cause pits in the zinc surface resulting in an imperfect zinc plate. This is in line with the last paragraph of the previously quoted statement:

> "A firmer, denser coating enabling the work to be passed with less actual metal on the surface and less rejected work to be replated."

While the quality of the electroplating has to be considered, the saving resulting from such a high-grade coating is not as apparent as that resulting from even corrosion of the anodes. Some tests carried out by Dr. O. P. Watts at the University of Wisconsin Electrochemical Laboratories show the effect of impurities in zinc anodes. The tests were carried out on four anodes, each one of different manufacture:

Analysis of Anodes in Percentaegs

	Zinc	Iron	Copper	Lead	Cadmium	Tin
A	99.347	Trace	Trace	.402	0.248	Nil
B	99.869	0.05	0.004	0.07	0.007	Nil
C	99.326	0.004	0.02	0.61	0.04	Nil
D	97.05	0.62	0.21	1.09	0.07	.96

The test showed that anode B, containing less than 0.14 per cent. of impurities, showed less scum and less crust than any of the other anodes. Anode D was by far the worst of the anodes. Not only did a large amount of scum and crust form on this anodes but the zinc plate resulting from this anode was badly treed. A repetition of the tests gave the same results as before.

Anode D was purchased from a supplier of electroplating supplies who advertises widely and who advertised these zinc anodes as being made of Horsehead Spelter. The table shows that this manufacturer has shown no regard for the rules of the Federal Trade Commission and has been

"putting over" the poorest kind of zinc onto the plater and which could not help but give a poor deposit. While tin in a nickel anode* apparently is not detrimental, it is highly detrimental in a zinc anode. It directly affects the quality of the deposit and this is direct proof that the quality of the anode does directly affect the quality of the deposit. The high tin, lead and iron content of this poor anode would indicate that the dealer was either using a cheap grade of scrap zinc containing solder or he was using a poor grade of spelter to which tin was added for the same purpose it is added occasionally to nickel anodes. The high iron content also indicates poor scrap zinc or carelessness in melting.

The 33 per cent. drop in metal cost experienced by the manufacturer previously quoted resulted from the greater purity represented by an anode having the analysis of B as compared to the earlier anodes having an analysis represented by A. The tests by Dr. Watts show that anode B of high purity was evenly corroded. Further, this anode pitted only slightly. This checks the result of the Milwaukee Company. The details of tests by Dr. Watts follow:

"A—Anode covered with scum and heavy chunks of this scum have broken off and float in electrolytic bath.

"B—Anode very clean and evenly corroded. Somewhat pitted but no dirt and scum has formed due to great purity of anode.

"C—Anode covered with a very heavy film of scum at the sides, heavy plates of foreign matter has formed caused by impurities in zinc.

"D—A great amount of scum and residue has formed. Same as in others noted above."

In considering the effect of impurities in anodes, the alloying action of zinc is of importance. Because 1% of iron is present does not result in the mere loss of the 1% of iron as a sludge. When iron is present in an excess of zinc, it forms a compound which consists of about 92% of zinc and 8% of iron. This compound is intensely hard and more insoluble than the zinc alone. Thus, it is seen that 1% of iron will account for 12% of the zinc anode. This will find its way into the sludge at the bottom of the tank.

How the other impurities affect the loss of zinc has not yet been made a subject of study. The presence of these compounds high in zinc further result in a type of corrosion which probably results in the splitting off of large pieces of metal. The anode often disintegrates rapidly due to the disintegration caused by the loosening of large pieces of metal. Further, these impurities have a tendency to segregate and this again is a cause for uneven corrosion.

The treeing caused by the presence of tin in the zinc anodes indicates that the tin goes into solution and directly affects the deposit. It may be possible that other metals go into solution in the same way or possibly are finely divided so that they are held in suspension and carried over into the deposit by the currents set up in the electrolyte. In whatever way the impurities may be carried to the deposit, the anode causes the difficulty and, furthermore, contaminates the electrolyte. The necessity of keeping the electrolyte in a high state of purity is shown by the purity required in the electro-refining of zinc. This leads back to the necessity for an electrolyte of high purity so that the plater should take great care to use zinc salts of high purity. Pure zinc anodes with an impure electrolyte may be just as bad as impure anodes with a pure electrolyte. The president of a large galvanizing equipment company states that a cheap zinc anode "many times causes the zinc electrolyte to get out of balance and incidentally cause us no end of trouble and expense."

How is it possible to get anodes of a high degree of purity and how can the user be assured that the anodes are of a high degree of purity? Those who have chemical laboratories can issue proper specifications and can see that such specifications are enforced. Those who are not equipped with laboratories must either depend upon analyses by commercial laboratories or must depend upon the supplier of anodes. There is a great temptation for "fly-by-night" concerns and unscrupulous and irresponsible dealers to supply anodes of poor quality. It is very easy to take the cheapest grade of scrap zinc of unknown quality containing solder, tin plate, brass, iron antimony, babbitt, etc., and melt it and sell it in the form of high-grade anodes. Such unscrupulous dealers must be driven out of business.

The unscrupulous dealer who sells a cheap scrap zinc at a large profit should not be tolerated by the plating trade.

To quote again from the statement of the president of a large galvanizing equipment company:

> "We never get a chance to talk fine points of an anode, we are too busy fighting the zinc * * * put on the market in anode form, which many times causes zinc electrolyte to get out of balance and incidentally causes us no end of trouble and expense.
>
> "After all is said and done, price very largely controls the anode situation. If we can offer a good anode at a slight advance * * * we have a chance to make the sale, but when this differential in price exceeds ½c a pound with the big buyers and a cent a pound with the little fellow, one can quote volumes of theoretical facts without gaining the confidence of the buyer."

The entire zinc anode situation is therefore governed to a large extent by the user.

The manager of the plating department previously quoted writes further:

> "You, yourself, probably are aware of the fact that we are entirely at the mercy of the people who furnish this class of goods to us, and, therefore, reliability of the concern furnishing same is of very great importance."

By buying from reliable concerns and, if possible, keeping a check upon the zinc anodes by an occasional chemical analysis, the user can be assured of a zinc anode which is of the highest degree of purity at a slightly greater initial cost, but which eventually will show a lower cost. This also applies to the purchase of the zinc salts. Of course, the other factors which enter into the situation, such as correct generating capacity, good electrical connections, proper design of the galvanizing unit and proper cleaning methods are of the utmost importance and must go hand-in-hand with the high purity anodes and electrolyte.

* C. T. Thomas and W. Blum Trans. Am. Elect. Soc. Vol. 45, Apr., 1924.

PLATERS AND FORMULA S

What is a formula?

A formula is a prescribed form, something to follow to obtain predetermined results.

Is it true that the plater uses and follows a given formula, if so, why all the grief of the plater, his plaintive wail, my nickle cut through easily, my copper blisters, my zinc solution does not throw, and any number of other wails, which are too familiar to all of you for me to mention.

What is wrong, is it the plater, or the formula, or both!

Let us see if we can find what the trouble is.

We will first take the plater, who is he, what is he, how did he come to be a plater!

Remember dear friends we are analyzing the average plater, not the expert.

What is his education? Is he a college man, or a high school graduate, undoubtly neither, you will find him probably a graduate of the eight elementary grades, or he might have had a year in high school, who has worked in a plating room from boyhood, or he may be a graduate of the polishing room.

Remember I am not trying to cast any reflection on the plater's education or ability. I know how hard he has worked to attain the knowledge he possesses. I am merely trying to make a cold blooded analysis.

Mentality:

Do we get the brightest or the dullest of the boys in the plating room? You all have had the experience of the employment department sending you a real bright boy to be interviewed, and after you have shown to him the plating room conditions and what was expected of him, heard him say, "I don't think I would care for this kind of work." The dull boys you don't want, so we can safely say that the average boy in the plating room is not above the average in intelligence, and it is from those boys that the plater of tomorrow is produced, and tomorrow you have a plater who is of average intelligence and whose primary education is approximately the eighth elementary grade. During this period from boyhood to manhood, he has worked hard and studied hard to learn the 'why' of the plating game, most of

his training has been practical the theoretical training which he should get is more or less overlooked, for he is a productive unit in the department. But he is now a plater, a foreman plater, and a member of the American Electroplaters' Society, and he attends the meetings, and gains knowledge thereby. And finally at one of the meetings he gets up on the floor to state that the concern he is with contemplates the zinc plating of some of their products, and he would like to get a formula for this solution, as he is not very familiar with zinc plating, and the members of the branch from the goodness of their hearts, give him the following formula:

Sodium Cyanide	53.2
Zinc Cyanide	59.2
Sodium Hydroxide	43.8
Sodium Carbonate	9.5
Aluminum Sulphate	4.7
Lingel	11.8
Water	1000.C.C.

In passing, I might state that this formula was formulated by W. Greenville Hosdi and Tyler Fuwa at the laboratory of applied chemistry, Mass. Institute of Technology at the suggestion of the National Tube Co. This formula gives excellent results, but must be handled properly. Our plater friend put this formula to work, and at the branch meeting the following month, made this report: For the first two or three weeks it worked fine, but then it died out, and I have done everything with it and can't make it work.

Now, what or who is wrong, the formula or the plater. Ask the plater and he will tell you that the formula is no good, ask those who developed the formula, and they will readily tell you that it is the plater. But can you expect a plater whose training has been almost entirely practical to know the "wearing" qualities of this solution, under the conditions in his plant, and that is something he must be able to do if he hopes to be able to control his solutions, no matter how well a formula may be standardized, local conditions will determine the life of the ingredients therein. I might illustrate what I mean by local conditions. By taking two boys of the same size, and give each a pair of shoes of the same quality, the mother of those boys can tell you al-

most to the day when repairs will be necessary in each case. That is what the plater must know when the ingredients in particular solutions will need replenishing, under his own condition. A formula is the jumping off place for the plater, after that it is entirely up to himself, if his solution conforms closely to the original formula his trouble will be negligable, and therein lies the secret of good plating, keeping your solution close to the original formula. You can't wait for the ingredients to wear out before replenishing that spells trouble, and you can't replenish according to the original formula, as the ratio of wear of the various ingredients is not the same. Has the plater's training been of the kind to enable him to determine the ratio of wear, or will he have to guess? If the deposition of metals take place according to given laws there should never be any guessing. But there is plenty of guessing done today and will continue so until the average plater is a well trained man, trained to follow given laws and surmount local conditions. I would advocate the training of bonafide apprentices under state regulations, whose education is at least equivalent to a high school graduate and should not be considered a productive unit until the period of apprenticship expires.

PAT SHEEHAN
Milwaukee Branch.

BRANCH NEWS

Philadelphia Branch

On November 22nd, Philadelphia Branch held its 10th Annual Banquet at Mosebachs Hall in Philadelphia. The afternoon session was attended by the largest number of platers assembled together at one time for an occasion of this purpose ever held in Philadelphia.

This meeting was presided over by Mr. Willard M. Scott, Foreman Plater, at the Frankford Arsenal.

The address of welcome was given by Pres. Geo. Gehling, who explained the work the Philadelphia Branch and the A. E. S. in conjunction with the Bureau of Standards at Washington were doing for the science of Electroplating and Finishing.

Mr. Proctor, the Founder of our Society, spoke on the prevention of pitting in a nickel soltuion, by the addition of Sodium peroxide, all of which was very instructive.

Mr. Fred. Sheddal of the Reading Branch and who we consider a genius in the art of metal colouring, gave a very interesting talk on the finishing of Automobile Hardware, matching the colours of the uphols-

tery and displayed samples which resembled enamel but which were electroplated by manipulating the copper, silver and nickel baths obtaining 14 standards colours. This was very interesting and well received.

Mr. F. Taylor, who is an Authority on Plating Generators, gave a very descriptive lecture on plating generators and this subject, fit in fine as we all are interested in where and how we get our juice.

Mr. J. Kennith Graham, who is affiliated with the U. of P., spoke on the past, present and the future of the chemical education of the Plater.

Mr. Weiland, of New York, gave a talk on a new method suggested as an aid to show up the distribution of a zinc plating on steel, piece to be tested is treated at 95 C with a solution containing Sodium peroxide 10 gram per liter, and glacical acetic acid 35 grams per liter, a rust stain will appear after a few minutes where plating is thin.

This subject was in line with the work reported and discussed at the Bureau of Standards at Washington on November 14th and 15th and at this time our representatives, Mr. Phil. Uhl, and Mr. W. M. Scott, read their report of the Bureau of Standards Meeting also showing a photograph of all those who attended, all of which was highly appreciated.

Mr. Poland of Baltimore, gave a lecture in connection with a five-reel moving picture, starting with views of the Western mining country and copper mining operations down through to the rolling of the anodes for the plater, all of which was very interesting and well received.

At this time a recess was taken for a jolly confab with old acquaintances from out of town, after which the Banquet and Social activities were in order and while we had the Turkey, the noise makers, singing as of other years, we also had as an added attraction, a prize winning Marching String Band of 39 pieces, one of Phila's New Year Mummers parade features and it was some treat to see these men march arond and among the tables and play.

This was Phila's Tenth Annual Meeting and Banquet and they are getting larger and better each year and it is our desire to have the best Educational Meeting and Banquet in the A. E. S., so you fellows in Chicago, New York and Newark better keep going if you don't want the platers from the Quaker City to pass you.

Toronto Branch

Our meeting held November 24th was intensely interesting and rather unusual in character. Dr. J. G. Cunningham and Dr. Bulmer of the Ontario Provincial Board of Health gave us an address on Nickel Rash and other vocational diseases. Dr. Cunningham told of the part legislation played in the protection of health, also of work done by the employer and the employee. He said a workers health was his capital and that unemployment effects less members than ill health. Ontario workers average 8 to 9 days lost time each year through illness, or five times as much as is lost by reason of accidents. Personal Hygiene is the most important factor for the individuals attention.

Cases of infection not properly treated by "first aid" costs Canadians over $3,000,000 per year.

Dr. Bulmer said the blood of "Nickel Rash" victims gave no indication of the trouble and that the rash was equally as prevalent among workers over sulphate solutions as among workers over chloride solutions. In our refinery there has been over 100 cases this year among workers attending nickel electrolytes, but not one case among workers attending copper sulphate solutions. Thorough washing of the hands and arms frequently was advised by members who have suffered from the rash. Iodine was strongly recommended for prevention and cure of cyanide sores. Iodine is more effective if the affected parts are dry. Hot double nickel sulphate solutions was pronounced more productive of skin irritation than cold solutions of either double or single nickel salts.

The subject for discussion was "Pickling" and included "Bites" used in preparing metals for plating. Samples of brass tabing pickled in HCL were shown by Mr. Joseph Ellis. Mention was made of the care required when pickling cast iron in order to preserve sharp corners. Treatment of steels with different percentages of carbon was given special attention and will be taken up at future meeting when a paper on the subject will be presented.

Mr. James Welsby of Stratford, Ont., sent in a pape ron "Pickling" which was read and received with apppreciative interest by all present. Mr. Welsby's cooperation in the work of the Society is a splendid sample of what a member located at a distance from his Branch can do to help toward its success. The paper will be sent to the Editor for publication. A rousing vote of thanks was given Mr. Welsby. Every feature of the eveenings program was so interesting that no one departed for home until 11:25. Our December meeting will be devoted to papers and discussions by members only. Then in January we intend having a speaker, followed by a discussion as during recent months. Only one member reported out of work, shows an improvement over September and October.

The Technical school class is now busy doing analytical work under the supervision of Mr. J. A. Magill.

Cleveland Branch

The Cleveland Branch met for its regular December meeting at the Hotel Winton. The meeting was called to order by President Scott at 8 P. M. It was our first open meeting, that is, open to foremen platers who can qualify to become members. The meeting was a grand success. It was the largest and most interesting in the history of the branch. The sustaining membership amendment was thoroughly discussed and we know just how the platers of Cleveland feel about it, and we have decided to conduct our branch right up to the Constitution, that is, in selecting our future members. It was most gratifying to the branch officers to have the boys turn out as they did, and hope that every member will be present at our next meeting. The Cleveland Branch wishes the Supreme Officers and all members of the body of the American Electroplaters' Society a Merry Christmas and a Happy New Year.

Grand Rapids Branch

Grand Rapids Branch of the A. E. S. held its regular meeting December 10, 1924, with a fairly good attendance.

We then had a very interesting talk by Mr. Zucker, who spoke on "Cleaners, Buffs and Composition."

Mr. Allen then showed us some samples which, after plating, had to be bent and colored. After a short talk by Mr. Allen we adjourned.

St. Louis Branch

Regular meeting held on December 2. The fact that we are using Blum and Hogaboom's "Electroplating and Electroforming" as a textbook, with Dr. H. C. Ward as an instructor, has resulted in larger attendance and more interesting meetings.

Our banquet committee reported having reserved January 31 as the date of our annual doings. There will be an educational session in afternoon with a party for the ladies, then the banquet, followed by dancing. It will be held at American Annex Hotel.

The educational session will be under direction of G. S. Robins. Dr. H. C. Ward will have prominent part on this program. In the evening Supreme President F. J. Hanlon and Supreme Secretary E. J. Musick will be principal speakers.

Waterbury Branch

At a meeting of Waterbury Branch, held November 28, the members listened to an interesting report from its delegates to the recent session of the Board of Research and Bureau of Standards, held in Washington, November 14 and 15. The local branch had three members present, Messers, Gray, Delage and Johnquest. The various subjects brought up for discussion at the conference were reported to the meeting, and proved to be very instructive. A photograph of those present at the Washington session was also shown.

A meeting with the largest number of A. E. S. members present that has been held in this city for some time was that of Friday, December 12. Big delegations were present from Bridgeport and New Haven, and several members from branches around the nearby States were present. The drawing card on this occasion was our old-time friend, George Hogaboom, formerly of this city, but now of New Britain. George was the organizer of the Waterbury Branch, and the boys naturally saw to it that the hall was filled. The subject of the talk given was "Brass Plating." The speaker started with the different chemicals that go to make up the solution, remarking on the difference in purity of same, past and present, stating that while sodium cyanide was generally used here, in Europe potassium cyanide seemed to be the favorite. Preferred the cyanides of the metals, the carbonates being deleterious to the solution, although all solutions had at least a small percentage of carbonates present. In remarking on additional agents, didn't agree with the amount of aqua ammonia used by some; favored carbolic acid, as an excess of same was not liable to be attained; also touched on carbonate of nickel and arsnic. A common high brass would consist of 63 parts copper and

37 parts zinc. A brass plate to match same would take from 76 to 80 parts copper and 20 to 24 parts zinc. Most of the trouble experienced by platers is due to the fact that they do not study the proper ratio in anodes and solutions. The dipping of anodes was unnecessary. The speaker dwelt a short time on the subject of copper and zinc andoes; also the effect and necessity of free cyanide. Temperature was another matter of prime importance. The speaker brought his subject to a close by explaining the latest method for removing carbonates from the tanks in summer and winter. A number of questions were asked and answered, after which refreshments were served. It was a big night for Waterbury Branch and all present enjoyed it greatly.

Chicago Branch

Regular monthly meeting Chicago Branch, held December 13, 1924, at Atlantic Hotel, 316 S. Clark street. Meeting called to order with President F. J. Hanlon presiding. There was a very good attendance. After reading of minutes, etc., President Hanlon called upon Mr. F. J. Liscomb, who gave a very detailed report of the Fall Joint Conference, held at Washington, D. C. A standing vote of thanks was given Mr. Liscomb for his splendid report.

A committee of three was appointed to petition Congress for better appropriations for research work being done at Bureau of Standards by Dr. Blum and his associates.

Banquet committee has set January 23, 1925, Elks' Club, 175 W. Washington street, as the date for our coming banquet.

Meeting was then turned over to librarian, who found the following questions in box:

Chicago Branch Question Box

Question (1). What is the best way to remove fire scale from sterling silver?

Answer—Ten to 20 per cent. sulphuric acid pickle.

Question (2) What causes green scum on surface and anodes of cyanide copper solution used hot?

Answer—Lack of cyanide was given as reason.

Question (3) What is a good way to strip gold from brass which has a resist?

Answer—A solution of one part nitric acid and three parts muriatic acid was recommended.

DEATHS

St. Louis Branch

Henry Driftmeyer .....119 Morgan Ave., Evansville, Ind.

Toronto Branch

Russell Giles, Active .....North Sidney, Nova Scotia
Edward E Martin, Active.....67 Hess St. North, Hamilton, Ontario
Albert T. Middleton, Active..12 Ryerson Ave., Niagara Falls, Ontario, Can.

APPLICATIONS FOR MEMBERSHIP

New York Branch

J. Reingold .....547 Bushwick Ave., Brooklyn, N. Y.
David E. Castle.....417 W. 46th St., New York City
D. Lantz .....729 East 9th St., New York City
Nicholas Hrycow .....209 Freeman St., Brooklyn, N. Y.
O. O'Leary .....437 Sacket St., Brooklyn, N. Y.
Thomas Murtha .....71 W. Jackson Ave., Corona, N. Y.
R. H. Quinn .....244 Reid Ave., Brooklyn, N. Y.
Alex. Kahn .....3046 E. 4th St., Brooklyn, N. Y.
Louis Platzman .....348 Powers Ave., Brooklyn, N. Y.
John C. Boyer .....422 Hudson St., N. Y. City
John Halas .....77 S. 5th St., Brooklyn, N. Y.
Hermon Ruhlmann .....38 Devoe St., Brooklyn, N. Y.

Cincinnati Branch

Alfred D. Lay .....503 S. Chestnut St., Marysville, Ohio

Grand Rapids Branch

Clarence Stimson .....Grand Rapids, Mich.

ELECTED TO MEMBERSHIP

Philadelphia Branch

Jas. MacCrendle .....c|o American Nickeloid Co., Walnutport, Pa.

Toronto Branch

Jas. B. Walsmley.....154 Portland St., Dartsmouth, Nova Scotia, Can.

Grand Rapids Branch

Edmund P. Braun .....345 Horatio Ave., Charlotte, Mich.

Bridgeport Branch

John J. Slattery .....94 Carlton Ave., Bridgeport, Conn.

New York Branch

E. B. Davidson

RESIGNED

Newark Branch

A. Baumler .....151 Washington Ave., Arlington, N. J.

REINSTATED

New York Branch

Louis J. Jenner .....33 Highland St., Springfield, Mass.

SUSPENDED

Toronto Branch

Robert Stokes .....499 Rogers St., Peterboro, Ontario, Canada

Philadelphia Branch

C. C. Bessler.....2840 Taney St., Philadelphia

PROVIDENCE - ATTLEBORO BANQUET

The Narragansett Hotel, Providence, R. I.

Saturday, January 24, 1925

Educational Program in Afternoon.

Banquet in the Evening

You are invited to enjoy the Seventh Annual Banquet of this Branch.

NEW YORK BRANCH BANQUET

WANTED

Everybody to attend the 16th Annual Founders day and banquet of the New York Branch, American Electroplaters Society to be held Saturday, February 21st, 1925 at the Aldine Club, 200-5th Ave., corner 23rd St., New York City. .....

Mr. Charles Procter, founder of this society will have charge of the educational program which will begin at 3 P. M. There will be talks by well informed speakers, also interesting papers read and discussed on subjects relating to plating.

A special invitation is extended to manufacturers together with their managers, superintendents, chemists and platers

Ladies will be entertained all of the afternoon at the club. Banquet 7 o'clock. ... ...

C. E. STIERS, Publicity Manager,
45 John St.,
New York City.